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Nematicidal effects of some botanicals against root-knot nematode, (*Meloidogyne javanica*) on tomato

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SUMMARY

An *in-vitro* experiment on the effect of water extracts of different plant parts showed that there was a significant reduction in the larval hatching of *Meloidogyne javanica* juveniles and the water extract of neem fruits at various dilutions proved to be most effective and that of bakain/Persian lilac leaves at same concentrations were least effective. Significant reduction in the root-knot development and improvement in the plant growth characters was observed when the same treatment of neem fruits was applied under glass house condition.

Key words : Water extracts, Hatching, *Meloidogyne javanica*, Tomato, Management.

In India, tomato (*Lycopersicon esculentum* L.) is severely affected by the root-knot nematode, *Meloidogyne spp*., having a yield loss up to 46% (Bhatti & Jain, 1977; Jain & Bhatti, 1978), 39.70% (Reddy, 1985a,b) and 61% (Nirmala Devi & Tikoo, 1992). The root-knot nematode, *Meloidogyne incognita* and *Meloidogyne javanica* are the most predominant and widely prevalent species inflicting serious losses in tomato. The chemical means of nematode control such as soil fumigation, application of various nematicides and pesticides etc pose enormous threat to both soil fauna as well as human beings. One of the promising alternatives is the use of plant parts/products to observe the possibility of their nematicidal/nematostatic properties for the management of nematode problem. The present investigation was, therefore, undertaken to highlight the nematicidal properties of leaves and fruits (neem and bakain/Persian lilac) and leaves and flowers (marigold) for managing the infection caused by root-knot nematode, *Meloidogyne javanica* on tomato cv. K-25.

MATERIALS AND METHODS

Water extracts of leaves and fruits (neem, *Azadirachta indica* A.Juss. and bakain/Persian lilac, *Melia azedarach* L.) and leaves and flowers (marigold, *Tagetes patula* Hort.) were prepared by grinding 50g of each in 150ml-distilled water in grinder. Extracts were filtered through four-ply muslin cloth and then passed through Whatmann filter paper No.1. Filtered extracts were then centrifuged at 3,000 rpm for 5 minutes. The filtered extracts served as standard 'S'. Other concentrations viz., S/2, S/10 and S/100 were prepared from 'S' concentration with distilled water. Five average-sized and freshly picked egg masses of *Meloidogyne javanica* were transferred to 40mm diameter Petridishes containing 10ml water extracts of different dilutions separately. Each treatment was replicated three times. The total number of hatched larvae was counted after 5 days under stereoscopic microscope. Hatching in distilled water served as control. Per cent inhibition over control was calculated.

Clay pots (15 cm diameter) filled with 1kg autoclaved soil were treated with two doses 50g/pot and 100g/pot of leaves and fruits of neem and bakain/Persian lilac and leaves and flowers of marigold separately, under glass house conditions. Each treatment was replicated three times including untreated inoculated and untreated uninoculated control. Three weeks old seedlings of tomato were then transplanted. The plants were inoculated with 2,000 freshly hatched second stage juveniles of root-knot nematode, *Meloidogyne javanica*. After the termination of the experiment the different plant growth parameters viz., plant length in cms and plant weight in gms (root &shoot) were recorded. The Root-Knot Index (R/I) was done on 0-5 scale of Taylor and Sasser (1978). The data was statistically analyzed for Critical Difference at P=0.05 and P=0.01.

RESULTS AND DISCUSSION

The results presented in Table 1 indicated that the water extracts of all the treatments adversely affected the juvenile hatching of *Meloidogyne javanica*. The highest inhibition in the larval hatching was obtained in

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